

What is claimed is:

1. An non-thermal plasma reactor for treating nitric oxide-bearing exhaust gas, comprising:

5 a plurality of electrodes defining at least one reaction zone receiving the gas, said electrodes each having an electrode plate and a fluoropolymeric substance applied to said electrode plate;

a voltage supply connected to the electrodes to provide a voltage across the electrodes.

10 2. A plasma reactor in accordance with claim 1, wherein said plurality of electrodes are of a planar configuration and are arranged in parallel formation.

15 3. A plasma reactor in accordance with claim 1, wherein the electrode plate has two surfaces and said fluoropolymeric substance is applied to the two surfaces.

20 4. A plasma reactor in accordance with claim 1, wherein said electrode plate is embedded in said fluoropolymeric substance.

25 5. A plasma reactor in accordance with claim 1, wherein said fluoropolymeric substance is fluorocarbon.

6. A plasma reactor in accordance with claim 1,  
further comprising spacers of a fluoropolymeric substance, that  
are positioned between adjacent electrodes to provide a gap  
therebetween.

5

7. A plasma reactor in accordance with claim 1,  
further comprising a insulating member of a fluoropolymeric  
substance, said member being configured with indentations to  
receive and support said electrodes.

10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20

8. An apparatus for converting nitric oxide in  
exhaust gas into nitrogen dioxide, comprising:

a plasma reactor having a plurality of electrodes  
defining at least one reaction zone receiving the gas, said  
electrodes each having an electrode plate and a fluoropolymeric  
substance applied to said electrode plate; and

a voltage supply connected to the electrodes to  
provide a voltage across the electrodes.

20

9. An apparatus in accordance with claim 8, further  
comprising a scrubber.

10. An apparatus in accordance with claim 8, further  
comprising an injector introducing ethanol into said gas.

25

11. An apparatus in accordance with claim 8, further comprising an inlet and an outlet, each connected to the plasma reactor.

5 12. An apparatus in accordance with claim 8, further comprising an ethanol bath through which at least a portion of the gas is diverted.

10 13. An apparatus in accordance with claim 8, wherein the voltage applied across the electrodes creates an electric field whose strength is above the critical field strength of the gas, but not so high as to establish a condition conducive to sustain arcing between the electrodes.

15 14. An apparatus in accordance with claim 8, wherein the voltage applied across the electrodes creates a multitude of short-lived current filaments within the gas.

20 15. An apparatus in accordance with claim 8, wherein reactive species are generated by the plasma reactor, to react with said nitric oxides.

25 16. An apparatus in accordance with claim 9, wherein the reactive species are electrons promoting primarily electron-molecule collisions in the gas.

17. An apparatus in accordance with claim 8,  
comprising at least three electrodes arranged in parallel  
formation defining at least two gaps therebetween through which  
the gas passes.